SACHITA NISHAL

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EDUCATION

Birla Institute of Technology and Science (BITS) Pilani, India *Aug '16 - Present*
Bachelor of Engineering (Honours), Computer Science
Current GPA : 8.08/10

Divine Child High School, Surat, India *Graduated May '16*
Central Board of Secondary Education (Science) Class 12
Overall Percentage: 97.2%

RESEARCH PROJECTS AND INTERNSHIPS

Research Assistant, Northwestern University *July '19 - Ongoing*

- Working under Dr. Luis Amaral to understand how creative ideas in films diffuse and evolve over time, and how they influence the cultural significance of films.
- Scraped textual data from TV Tropes, employing bipartite networks, statistical testing and machine learning to qualify relationships between trope dynamics, genre norms, and the success of films.

Research Intern, Indian Institute of Science Bangalore *Dec '18 - May '19*

- Worked under Dr. Rajiv Kumar Chaturvedi and Dr. Jaideep Joshi to predict burnt area from forest fires, using the Global Fire Emissions Database.
- Designed Artificial Neural Networks (ANN) and Long Short Term Memory (LSTM) models for prediction, and compared their performances over the dataset.

Undergraduate Research Project, BITS Pilani *Jan '18 - Dec '18*

- Worked under Dr. Sukanta Mondal to study network biomarkers and machine learning algorithms for disease classification.
- Pre-processed multi-class genetic expression data using Shannon's Entropy combined with PCA, and designed an ANN for the classification of lung cancer types.

Research Intern, Indian Institute of Technology (IIT), Madras *May '18 - July '18*

- Worked under Dr. Karthik Raman on using machine learning techniques for the prediction of protein-ligand binding affinities, for applications in drug design.
- Carried out a study of pre-existing methods that input 3D structural data of ligand-receptor complexes into Convolutional Neural Networks (CNNs) for predictions.
- Replicated several types of regression-based and classification-based CNNs from papers, using Tensorflow and PyTorch.

Undergraduate Research Project, BITS Pilani *Aug '17 - Dec '17*

- Worked under Dr. Toby Joseph to simulate the workings of the inner ear in humans, and reproduce its features qualitatively.
- Used MATLAB to model the inner ear hair cell as an RC circuit; the basilar membrane as a nonlinear damped oscillator, and neurotransmitter release at synapses as a Poisson process.

Research Intern, IISER, Pune *May '17 - July '17*

- Worked under Dr. Sutirth Dey to create evolutionary models of randomised genetic and epigenetic mutations in Wright-Fisher populations.

– Replicated a quantitative model in Python to account for mutations in gene pool. Graphed the resulting evolutionary dynamics to further the understanding of interplay of genetic and epigenetic factors in population fitness.

AWARDS AND SCHOLARSHIPS

Summer Internship Award (SIA) 2018 *May '18*

– Received funding from BITS Pilani to pursue independent research activities in May-July 2018
– Competitive application (4 students out of >100 accepted), based on research proposal, scholastic excellence, and student productivity.

LIST OF PUBLICATIONS AND POSTERS

Minimal Modelling of Primary Auditory Neuron Behaviour Synapsing to Inner Hair Cells

– Project poster presented with Dr. Toby Joseph at the 5th Complex Dynamical Systems and Applications Conference (CDSA 2017) at IIT, Guwahati

RELEVANT COURSEWORK

Courses taken at BITS Pilani:

MATH F113: Probability and Statistics
MATH F112: Linear Algebra and its Applications
CS F211: Data Structures and Algorithms
BITS F312: Neural Networks and Fuzzy Logic

Courses taken online (Coursera, EdX etc.):

Neural Networks and Deep Learning
Structuring Machine Learning Projects
Improving Deep Neural Nets: Hyperparameter Tuning, Regularization and Optimisation
Convolutional Neural Networks
Natural Language Processing with Deep Learning
Social and Economic Networks: Models and Analysis
Introduction to Dynamical Systems and Chaos

TEACHING, MENTORING AND LEADERSHIP

Teaching Assistant for Environment, Development and Climate Change *Aug '18 - Dec '18*

– Assisted Dr. Rajiv Kumar Chaturvedi, BITS Pilani, Goa
– Designed and helped evaluate assignments to gauge how students understood issues concerning climate change and climate policies in India.

Editor and Speaker for The BITS R&D Blog, BITS Pilani, Goa *Jan '18 - Present*

– Part of the student team that created and maintained this public blog. Wrote articles and gave short talks which detailed the technical research endeavours of BITS students and alumni.

TECHNICAL SKILLS

Programming Languages: Python 3, R, SQL, Java, C++, C, MATLAB
Libraries/Tools: Tensorflow, PyTorch, Keras, Scikit-Learn, NetworkX, BeautifulSoup

**Text in violet indicates hyperlink*